

JUN 04 2015

AWMD/WRAP IO

June 3, 2015

Mr. Michael Dandurand, P.E.
Environmental Engineer
RCRA Corrective Action and Permits Branch
Air and Waste Management Division
United States Environmental Protection Agency, Region VII
11201 Renner Blvd.
Lenexa, KS 66219

MWH #10507318.010201

RE: Data Summary for Spring Groundwater Monitoring Event
Former Maytag Laundry Products Plant #2 Facility, Newton, Iowa
RCRA ID No. IAD005285689
Docket No. RCRA 07-2010-0012

Dear Mr. Dandurand:

On behalf of Whirlpool Corporation (Whirlpool), and in accordance with the United States Environmental Protection Agency Region VII (EPA) letter to Whirlpool dated March 18, 2015, MWH has prepared this letter to summarize activities and results of the one-time spring 2015 groundwater monitoring event conducted at the Maytag Newton Laundry Products Plant #2 Facility (site).

GROUNDWATER MONITORING ACTIVITIES

On May 4, 5, and 6, 2015, MWH conducted the spring groundwater monitoring event in accordance with procedures specified in the May 2011 Work Plan for Corrective Measures Implementation (CMI) Groundwater Monitoring (CMI Work Plan) and Quality Assurance Project Plan (QAPP) to verify current contaminant of concern (COC) concentrations in Paint/Paint Mix Area monitoring wells MW-8R, MW-19D, and MW-34 and Incinerator Area monitoring wells MW-2NEW, MW-10A, and MW-23. Groundwater COCs are comprised of 1,4-dioxane, and the volatile organic compounds (VOCs) tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and 1,1-dichloroethene (1,1-DCE).

Well Gauging

Prior to sample collection, MWH measured the water level and total depth of each of the six wells in the spring groundwater monitoring network to determine groundwater elevations and identify potential screen occlusion. Spring 2015 well gauging and groundwater elevation data are summarized with corresponding well construction data in Table 1. As indicated in Table 1,

RCRA



536896

11153 Aurora Avenue
Des Moines, IA 50322-7904

TEL 515 253 0830
FAX 515 253 9592
www.mwhglobal.com

the well screen of monitoring well MW-10A was determined to be approximately 22 percent occluded with sediment and, therefore, the well was redeveloped 48 hours prior to sample collection.

Groundwater Sample Collection

MWH performed well purging and groundwater sample collection using nondedicated QED Environmental Systems, Inc. (QED) Sample Pro stainless steel submersible bladder pumps, dedicated disposable bladders and grab plates, dedicated Teflon[®]-lined polyethylene tubing, a QED MP-10 pump controller, and compressed nitrogen in accordance with the low-flow purging and sampling techniques specified in the CMI Work Plan. Field parameters were measured at regular intervals during the purging of each well with a calibrated multiparameter water quality meter with a flow-through cell and a separate digital turbidity meter. Well purging and sampling details were recorded on individual Groundwater Sample Collection Records. Groundwater samples were collected directly into laboratory-supplied containers and placed on wet ice in coolers for storage and transport.

Investigation-Derived Waste (IDW) Disposal

Water generated from well purging and equipment decontamination activities was segregated by well and containerized in twelve individually-labeled 5-gallon buckets. A composite sample (IDW-01) was collected from the approximately 34 gallons of containerized water. Following receipt of analytical results, MWH coordinated with the City of Newton Water Pollution Control Division, to dispose of the containerized water by discharge through an on-site sanitary sewer manhole on May 27, 2015.

Laboratory Analysis

Groundwater, IDW, and associated quality control (QC) samples were transported under chain-of-custody protocol to Keystone Laboratories, Inc. in Newton, Iowa for analysis of the COCs. The laboratory analytical report for the spring 2015 groundwater monitoring event is provided as Attachment A.

Data Validation

Validation of spring 2015 groundwater data was conducted by MWH in accordance with the QAPP as documented in the Quality Control Summary Report provided as Attachment B. Based on the data validation results, the spring 2015 groundwater sample data are considered usable as qualified.

COC CONCENTRATIONS

Spring 2015 COC groundwater concentrations in the upper and deep aquifers are summarized with historical COC data in Figures 1 and 2, respectively.

MWH appreciates your review of this data summary. If you have questions, please contact me at 515-253-0830.

Sincerely,



Karin H. Wilhelm
Project Manager

/csh:khw:vas

Attachments:

Table 1 Spring 2015 Groundwater Monitoring Network and Gauging Data

Figure 1 Spring 2015 Distribution of COCs in Groundwater – Upper Aquifer

Figure 2 Spring 2015 Distribution of COCs in Groundwater – Deep Aquifer

Attachment A Laboratory Analytical Reports

Attachment B Quality Control Summary Report

cc: Robert Karwowski - Whirlpool Corporation

TABLE

TABLE 1

**WELL CONSTRUCTION AND SPRING 2015 GAUGING DATA
FORMER MAYTAG LAUNDRY PRODUCTS PLANT #2 FACILITY – NEWTON, IOWA**

Monitoring Well	Top of Casing Elevation (ft NAVD-88)	Ground Surface Elevation (ft NAVD-88)	Top of Screen Elevation (ft NAVD-88)	Constructed Total Depth (ft btoc)	Screen Length (ft)	Measured Depth to Water (May 4, 2015) (ft btoc)	Groundwater Elevation (May 4, 2015) (ft NAVD-88)	Measured Depth to Water (May 6, 2015) ^a (ft btoc)	Groundwater Elevation (May 6, 2015) ^a (ft NAVD-88)	Total Depth (May 4, 2015) (ft btoc)	Screen Occlusion (May 4, 2015) (%)	Total Depth (May 6, 2015) ^a (ft btoc)	Screen Occlusion (May 6, 2015) ^a (%)
MW-2NEW ^b	963.24	960.22	952.70	23.35	10	11.49	951.75	--	--	22.56	8%	--	--
MW-8R	959.95	960.66	950.92	19.03	10	3.87	956.08	--	--	19.03	0%	--	--
MW-10A ^b	947.83	945.87	904.00	48.83	5	5.28	942.55	10.03	937.80	47.73	22%	48.61	4%
MW-19D	964.36	964.91	916.91	53.01	5	10.38	953.98	--	--	52.90	1%	--	--
MW-23	951.95	952.20	941.56	20.42	10	4.76	947.19	--	--	20.36	1%	--	--
MW-34	960.91	961.19	950.29	18.93	10	6.20	954.71	--	--	17.89	10%	--	--

Notes:^a = Following redevelopment of well on May 4, 2015.^b = Well has a stick-up completion.

% = Percent.

-- = Not measured.

btoc = Below top of well casing.

ft = Feet.

NAVD-88 = North American Vertical Datum 1988.

ATTACHMENT A

5/29/2015

Chris Hiatt
MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201

This analytical report is for the samples received on 5/5/2015 4:07:00PM. If you have any questions concerning this report please feel free to contact me at 1-800-858-5227. The samples included in this analytical report are as follows:

Sample Description	Laboratory ID	Matrix	Date Sampled
TB01-0515	1E50241-01	Water	05/04/15 14:15
MW23-0515	1E50241-02	Water	05/04/15 14:15
MW19D-0515	1E50241-03	Water	05/04/15 16:05
MW34-0515	1E50241-04	Water	05/04/15 17:10
MW8R-0515	1E50241-05	Water	05/05/15 13:15
MW2NEW-0515	1E50241-06	Water	05/05/15 15:25
EB01-0515	1E50241-07	Water	05/05/15 15:35
TB02-0515	1E50241-08	Water	05/06/15 14:00
MW10A-0515	1E50241-09	Water	05/06/15 14:00
DUP01-0515	1E50241-10	Water	05/06/15 00:00
IDW-01	1E50241-11	Water	05/06/15 15:15

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Sincerely,



Sue Thompson For Jeffrey King, Ph.D., Laboratory Director

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

CASE NARRATIVE

All analytical results for this Work Order meet(s) the laboratory established acceptance criteria for the method(s) requested with the following exceptions.

1,4-Dioxane is not routinely available on the IDNR application for certification.

Keystone

LABORATORIES, INC.

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15



MEMBER
ACIL

CHAIN OF CUSTODY RECORD

Keystone
LABORATORIES, INC.

600 East 17th Street South
Newton, IA 50208
641-792-8451

Page 1 of 1
Printed: 4/30/2015 2:34:15PM

www.keystonelabs.com

SITE INFORMATION

Sampler: C. HIAT

Project: Maytag Company Plant #2
010201
10507318.010201 CH

SPECIAL INSTRUCTIONS

None (SEE REMARKS)

Turn Around Time

☒ Standard ☐ RUSH, need by 1/1

REPORT TO

Chris Hiatt
MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

INVOICE TO

Accounts Payable
MWH Global - IA
PO Box 8810
Broomfield, CO 80021

LAB USE ONLY

Work Order 1E50241

Temperature

Turn-Cooler: No

☐ Custody Seal
☐ Containers Intact
☐ COC/Labels Agree
☐ Preservation Confirmed
☐ Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
01-001	TB01-0515	Water	GRAB	5/4/15	1415	2	8260-122 8270-203-SIM CH	01
01-002	MW23-0515	Water	GRAB	5/4/15	1415	12	8260-122 8270-203-SIM	02
01-003	MW19D-0515	Water	GRAB	5/4/15	1605	4	8260-122 8270-203-SIM	03
01-004	MW34-0515	Water	GRAB	5/4/15	1710	4	8260-122 8270-203-SIM	04
01-005	MW6R-0515	Water	GRAB	5/5/15	1315	4	8260-122 8270-203-SIM	05
01-006	MW2NEW-0515	Water	GRAB	5/5/15	1525	4	8260-122 8270-203-SIM	06
01-007	EB01-0515	Water	GRAB	5/5/15	1535	4	8260-122 8270-203-SIM	07

Relinquished By

Date/Time

Relinquished By

Date/Time

Remarks: EXTRA VOLUME MW23 FOR

MS/MSD, 8260 = PCE, TCE, 1,1-DCE;
CIS-1,2-DCE ONLY

Received By

Date/Time

Received for Lab By

Date/Time

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy



MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

CHAIN OF CUSTODY RECORD									
Keystone LABORATORIES, INC.		600 East 17th Street South Newton, IA 50208 841-792-8451				Page 1 of 1 Printed: 5/5/2015 4:07:20PM www.keystonelabs.com			
		SITE INFORMATION Sampler: <u>C. HIATT</u> Project: <u>Maytag Company Plant #2</u> 10507318.010101		REPORT TO Chris Hiatt MWH Americas, Inc.-IA 11153 Aurora Avenue Des Moines, IA 50322		INVOICE TO Accounts Payable MWH Global - IA PO Box 8610 Broomfield, CO 80021			
SPECIAL INSTRUCTIONS • None <u>(SEE REMARKS)</u> Turn Around Time <input checked="" type="checkbox"/> Standard <input type="checkbox"/> RUSH, need by <u> 1 / 1 / </u>		LAB USE ONLY Work Order <u>1E50241</u> Temperature _____ Turn-Cooler: No				<input type="checkbox"/> Custody Seal <input type="checkbox"/> Containers Intact <input type="checkbox"/> COC/Labels Agree <input type="checkbox"/> Preservation Confirmed <input type="checkbox"/> Received on Ice			
Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
01-001	<u>T002-0515</u>	Water	GRAB	<u>5/6/15</u>	<u>1400</u>	<u>2</u>	8260-122	8270-203-SIM <u>CH</u>	<u>08</u>
01-002	<u>MW10A-0515</u>	Water	GRAB	<u>5/6/15</u>	<u>1400</u>	<u>4</u>	8260-122	8270-203-SIM	<u>09</u>
01-003	<u>DUP01-0515</u>	Water	GRAB	<u>5/6/15</u>	<u> </u>	<u>4</u>	8260-122	8270-203-SIM	<u>10</u>
01-004	<u>10W-01</u>	Water	GRAB	<u>5/6/15</u>	<u>1515</u>	<u>4</u>	8260-122	8270-203-SIM	<u>11</u>
01-005	_____	Water	GRAB	<u>1/1</u>	_____	_____	8260-122	8270-203-SIM	_____
01-006	_____	Water	GRAB	<u>1/1</u>	_____	_____	8260-122	8270-203-SIM	_____
02-001	<u>TB-</u>	Water	GRAB	<u>1/1</u>	_____	_____	8260-122	_____	_____
Relinquished By <u>[Signature]</u> Date/Time <u>5/6/15 1545</u>		Relinquished By _____ Date/Time _____		Remarks: <u>\$260 = 906, T06, 1-1 D06; 015-1,2-D06.</u>					
Received By _____ Date/Time _____		Received for Lab By <u>[Signature]</u> Date/Time <u>5/6/15 15:45</u>							
Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy									

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Keystone

LABORATORIES, INC.



MEMBER
ACIL

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Keystone Laboratories, Inc. Cooler Receipt Form

Cooler I.D. # NI-08036

Delivered By: UPS / FedEx / Speedy / Mail / Walk-in / Courier / Other: _____ Date Received: 5/5/15 By: LRM

Tracking #: _____ Custody Seal: ☒ Present ☐ Absent ☐ Broken Seal #: _____

Type of packing material: Bubble / Foam / Paper / Peanuts / Other: _____ COC signed and date: Yes / No

Samples cooled by: Ice / Ice pack / NA Cooler Temp. (Includes correction factor): 2.4

Sample Receipt Discrepancies: ☒ No ☐ Yes (if Yes, see detail below)

<input type="checkbox"/> Chain of Custody not present <input type="checkbox"/> Information obtained from PO/ letter received with samples	<input type="checkbox"/> Description on container label different from COC: _____
<input type="checkbox"/> Container Problems: <input type="checkbox"/> Label Absent <input type="checkbox"/> Incorrect Containers for tests indicated <input type="checkbox"/> Insufficient amount of sample for tests indicated <input type="checkbox"/> Broken or leaking containers: _____	<input type="checkbox"/> Sample listed on COC but not received: <input type="checkbox"/> Trip Blank Custody seals absent <input type="checkbox"/> Trip Blank Custody seals broken
<input type="checkbox"/> COC incomplete <input type="checkbox"/> COC missing time sampled, time obtained from sample container. <input type="checkbox"/> COC missing date sampled, date obtained from sample container <input type="checkbox"/> Sample excluded from COC: _____	<input type="checkbox"/> Air bubbles in VOA vials: _____

Detailed Comments: _____

Client contacted regarding cooler/sample receipt conditions: Yes / No Contacted by: _____ Date/Time: _____

Who was contacted: _____ Remarks: _____

Revision 2, 02/06/07
Keystone Laboratories, Inc.

1E50241 MWH Americas, Inc.-IA
05/19/15 17:00 Jeffrey King, Ph.D.
Maytag Company Plant #2
10507318.010201 M P P

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Phone: 1-800-838-5227

600 East 17th Street South
Newton, IA 50208

Fax: 641-792-7989

Keystone LABORATORIES, INC.



MEMBER
ACIL

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Keystone Laboratories, Inc. Cooler Receipt Form

Cooler I.D. # N1-12016

Delivered By: UPS / FedEx / Speedy / Mail / Walk-in / Courier / Other: _____ Date Received: 5-6-15 By: Kas

Tracking #: _____ Custody Seal: ☒ Present ☐ Absent ☐ Broken Seal #: _____

Type of packing material: Bubble / Foam / Paper / Peanuts / Other: _____ COC signed and date: Yes / No

Samples cooled by: Ice / Ice pack / NA Cooler Temp. (Includes correction factor): -2.8

Sample Receipt Discrepancies: ☒ No ☐ Yes (if Yes, see detail below)

<input type="checkbox"/> Chain of Custody not present <input type="checkbox"/> Information obtained from PO/ letter received with samples	<input type="checkbox"/> Description on container label different from COC: _____
<input type="checkbox"/> Container Problems: <input type="checkbox"/> Label Absent <input type="checkbox"/> Incorrect Containers for tests indicated <input type="checkbox"/> Insufficient amount of sample for tests indicated <input type="checkbox"/> Broken or leaking containers: _____	<input type="checkbox"/> Sample listed on COC but not received: <input type="checkbox"/> Trip Blank Custody seals absent <input type="checkbox"/> Trip Blank Custody seals broken
<input type="checkbox"/> COC incomplete <input type="checkbox"/> COC missing time sampled, time obtained from sample container. <input type="checkbox"/> COC missing date sampled, date obtained from sample container <input type="checkbox"/> Sample excluded from COC: _____	<input type="checkbox"/> Air bubbles in VOA vials: _____

Detailed Comments: _____

Client contacted regarding cooler/sample receipt conditions: Yes / No Contacted by: _____ Date/Time: _____

Who was contacted: _____ Remarks: _____

Revision 2, 02/06/07
Keystone Laboratories, Inc.

1E50241 MWH Americas, Inc.-IA
05/19/15 17:00 Jeffrey King, Ph.D.
Maytag Company Plant #2
10507318.010201 M P P

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Phone: 1-800-858-5227

600 East 17th Street South
Newton, IA 50208

Fax: 641-792-7989

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

TB01-0515
1E50241-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	--------------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B	
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"	
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"	
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		109 %	84-128		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		102 %	75-136		"	"	"	"	
Surrogate: Toluene-d8		101 %	89-110		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	79-123		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 8 of 23

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW23-0515
1E50241-02(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	2.7	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane		105 %	84-128		"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		94.3 %	75-136		"	"	"	"
Surrogate: Toluene-d8		102 %	89-110		"	"	"	"
Surrogate: 4-Bromofluorobenzene		99.3 %	79-123		"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	3	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5		67.5 %	16-145		"	"	"	"

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

MWH Americas, Inc. -IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW19D-0515
1E50241-03(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B	
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"	
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"	
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		103 %	84-128		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		95.9 %	75-136		"	"	"	"	
Surrogate: Toluene-d8		104 %	89-110		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	79-123		"	"	"	"	

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	5	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C	
Surrogate: Nitrobenzene-d5		71.8 %	16-145		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW34-0515
1E50241-04(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane	104 %	84-128	"	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	94.0 %	75-136	"	"	"	"	"	"
Surrogate: Toluene-d8	101 %	89-110	"	"	"	"	"	"
Surrogate: 4-Bromofluorobenzene	97.9 %	79-123	"	"	"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	6	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5	69.7 %	16-145	"	"	"	"	"	"

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW8R-0515
1E50241-05(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	--------------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	2.0	1.0	"	"	"	"	"	"
Trichloroethylene	3.5	2.0	"	"	"	"	"	"
Tetrachloroethylene	23.3	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane		106 %	84-128		"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		93.6 %	75-136		"	"	"	"
Surrogate: Toluene-d8		105 %	89-110		"	"	"	"
Surrogate: 4-Bromofluorobenzene		99.1 %	79-123		"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	4	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5		70.6 %	16-145		"	"	"	"

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW2NEW-0515
1E50241-06(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	4.2	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	7.1	1.0	"	"	"	"	"	"
Trichloroethylene	4.4	2.0	"	"	"	"	"	"
Tetrachloroethylene	27.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane		103 %	84-128		"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		94.8 %	75-136		"	"	"	"
Surrogate: Toluene-d8		103 %	89-110		"	"	"	"
Surrogate: 4-Bromofluorobenzene		101 %	79-123		"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	9	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5		67.2 %	16-145		"	"	"	"

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

EB01-0515
1E50241-07(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane	105 %	84-128	"	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	95.3 %	75-136	"	"	"	"	"	"
Surrogate: Toluene-d8	104 %	89-110	"	"	"	"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	79-123	"	"	"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	<0.4	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5	72.8 %	16-145	"	"	"	"	"	"

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

TB02-0515
1E50241-08(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	--------------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/13/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane	110 %	84-128	"	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	99.3 %	75-136	"	"	"	"	"	"
Surrogate: Toluene-d8	102 %	89-110	"	"	"	"	"	"
Surrogate: 4-Bromofluorobenzene	97.7 %	79-123	"	"	"	"	"	"

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

MW10A-0515
1E50241-09(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	3.5	2.0	ug/L	1	1YE0474	05/13/15	05/14/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane		107 %	84-128		"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		96.3 %	75-136		"	"	"	"
Surrogate: Toluene-d8		101 %	89-110		"	"	"	"
Surrogate: 4-Bromofluorobenzene		97.8 %	79-123		"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	10	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5		77.0 %	16-145		"	"	"	"

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 16 of 23

MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

DUP01-0515
1E50241-10(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	3.3	2.0	ug/L	1	1YE0474	05/13/15	05/14/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane	106 %	84-128	"	"	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	92.7 %	75-136	"	"	"	"	"	"
Surrogate: Toluene-d8	102 %	89-110	"	"	"	"	"	"
Surrogate: 4-Bromofluorobenzene	99.3 %	79-123	"	"	"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	9	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5	72.8 %	16-145	"	"	"	"	"	"

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

IDW-01

1E50241-11(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	----------	----------	--------	-------

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

1,1-Dichloroethylene	<2.0	2.0	ug/L	1	1YE0474	05/13/15	05/14/15	EPA 8260B
cis-1,2-Dichloroethylene	<1.0	1.0	"	"	"	"	"	"
Trichloroethylene	<2.0	2.0	"	"	"	"	"	"
Tetrachloroethylene	<1.0	1.0	"	"	"	"	"	"
Surrogate: Dibromofluoromethane	108 %	84-128			"	"	"	"
Surrogate: 1,2-Dichloroethane-d4	95.5 %	75-136			"	"	"	"
Surrogate: Toluene-d8	101 %	89-110			"	"	"	"
Surrogate: 4-Bromofluorobenzene	92.2 %	79-123			"	"	"	"

Determination of Base/Neutral Extractable Compounds

1,4-Dioxane	5	0.4	ug/L	1	1YE0349	05/11/15	05/18/15	EPA 8270C
Surrogate: Nitrobenzene-d5	65.9 %	16-145			"	"	"	"

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1YE0474 - EPA 5030B

Blank (1YE0474-BLK1)

Prepared & Analyzed: 05/13/15

1,1-Dichloroethylene	ND		2.0	ug/L							
cis-1,2-Dichloroethylene	ND		1.0	"							
Trichloroethylene	ND		2.0	"							
Tetrachloroethylene	ND		1.0	"							
Surrogate: Dibromofluoromethane	53.1			"	50.0000		106	84-128			
Surrogate: 1,2-Dichloroethane-d4	47.8			"	50.0000		95.7	75-136			
Surrogate: Toluene-d8	50.5			"	50.0000		101	89-110			
Surrogate: 4-Bromofluorobenzene	51.2			"	50.0000		102	79-123			

LCS (1YE0474-BS1)

Prepared & Analyzed: 05/13/15

1,1-Dichloroethylene	57.85		2.0	ug/L	50.0000		116	84-146			
cis-1,2-Dichloroethylene	55.62		1.0	"	50.0000		111	86-130			
Trichloroethylene	53.88		2.0	"	50.0000		108	90-129			
Tetrachloroethylene	55.32		1.0	"	50.0000		111	82-133			
Surrogate: Dibromofluoromethane	50.8			"	50.0000		102	84-128			
Surrogate: 1,2-Dichloroethane-d4	52.7			"	50.0000		105	75-136			
Surrogate: Toluene-d8	52.5			"	50.0000		105	89-110			
Surrogate: 4-Bromofluorobenzene	51.2			"	50.0000		102	79-123			

Matrix Spike (1YE0474-MS1)

Source: 1E50241-02

Prepared & Analyzed: 05/13/15

1,1-Dichloroethylene	57.64		2.0	ug/L	50.0000	ND	115	85-149			
cis-1,2-Dichloroethylene	55.37		1.0	"	50.0000	1.02	109	83-136			
Trichloroethylene	54.92		2.0	"	50.0000	0.63	109	92-132			
Tetrachloroethylene	53.91		1.0	"	50.0000	2.69	102	85-133			
Surrogate: Dibromofluoromethane	51.7			"	50.0000		103	84-128			
Surrogate: 1,2-Dichloroethane-d4	53.7			"	50.0000		107	75-136			
Surrogate: Toluene-d8	51.9			"	50.0000		104	89-110			
Surrogate: 4-Bromofluorobenzene	50.8			"	50.0000		102	79-123			

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 1YE0474 - EPA 5030B

Matrix Spike Dup (1YE0474-MSD1)		Source: 1E50241-02			Prepared & Analyzed: 05/13/15						
1,1-Dichloroethylene	57.76		2.0	ug/L	50.0000	ND	116	85-149	0.208	11	
cis-1,2-Dichloroethylene	55.49		1.0	"	50.0000	1.02	109	83-136	0.216	10	
Trichloroethylene	56.00		2.0	"	50.0000	0.63	111	92-132	1.95	10	
Tetrachloroethylene	55.15		1.0	"	50.0000	2.69	105	85-133	2.27	11	
Surrogate: Dibromofluoromethane	50.1			"	50.0000		100	84-128			
Surrogate: 1,2-Dichloroethane-d4	52.0			"	50.0000		104	75-136			
Surrogate: Toluene-d8	51.8			"	50.0000		104	89-110			
Surrogate: 4-Bromofluorobenzene	51.3			"	50.0000		103	79-123			

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Determination of Base/Neutral Extractable Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1YE0349 - 3520C B/N Cont Liq											
Blank (1YE0349-BLK1)						Prepared: 05/11/15 Analyzed: 05/18/15					
1,4-Dioxane	ND		0.4	ug/L							
Surrogate: Nitrobenzene-d5	ND			"	9.05000		56.4	16-145			
LCS (1YE0349-BS1)						Prepared: 05/11/15 Analyzed: 05/18/15					
1,4-Dioxane	3.2		0.4	ug/L	5.40000		59.4	21-100			
Surrogate: Nitrobenzene-d5	5.89			"	9.05000		65.1	16-145			
Matrix Spike (1YE0349-MS1)						Source: 1E50241-02 Prepared: 05/11/15 Analyzed: 05/18/15					
1,4-Dioxane	6.8		0.4	ug/L	5.80022	3.1	64.1	30-101			
Surrogate: Nitrobenzene-d5	6.77			"	9.72073		69.6	16-145			
Matrix Spike Dup (1YE0349-MSD1)						Source: 1E50241-02 Prepared: 05/11/15 Analyzed: 05/18/15					
1,4-Dioxane	6.2		0.4	ug/L	5.66632	3.1	54.9	30-101	9.35	30	
Surrogate: Nitrobenzene-d5	6.24			"	9.49633		65.7	16-145			
Reference (1YE0349-SRM1)						Prepared: 05/11/15 Analyzed: 05/18/15					
1,4-Dioxane	3.8		0.4	ug/L	5.40000		69.4	70-130			QR-05
Surrogate: Nitrobenzene-d5	5.92			"	9.05000		65.4	16-145			

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Certified Analyses included in this Report

Method/Matrix	Analyte	Certifications
<i>EPA 8260B in Water</i>		
	1,1-Dichloroethylene	KS-NT,NELAC,SIA1X
	trans-1,2-Dichloroethylene	KS-NT,NELAC,SIA1X
	1,1-Dichloroethane	KS-NT,NELAC,SIA1X
	cis-1,2-Dichloroethylene	SIA1X
	2-Butanone (MEK)	KS-NT,NELAC,SIA1X
	Chloroform	KS-NT,NELAC,SIA1X
	1,1,1-Trichloroethane	KS-NT,NELAC,SIA1X
	Trichloroethylene	KS-NT,NELAC,SIA1X
	Toluene	KS-NT,NELAC,SIA1X
	Tetrachloroethylene	KS-NT,NELAC,SIA1X
	Ethylbenzene	KS-NT,NELAC,SIA1X
	Xylenes, total	KS-NT,NELAC,SIA1X

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	05/31/2015
KS-NT	Kansas Department of Health and Environment	E-10287	05/31/2015
MO-KC	Missouri Department of Natural Resources	140	04/30/2015
NELAC	New Jersey Department of Environmental Protection	IA001	06/30/2015
SIA1X	Iowa Department of Natural Resources	95	02/01/2016

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MWH Americas, Inc.-IA
11153 Aurora Avenue
Des Moines, IA 50322

Project: Maytag Company Plant #2
Project Number: 10507318.010201
Project Manager: Chris Hiatt

Reported:
05/29/15 16:15

Notes and Definitions

QR-05 The reference standard was outside of established control limits. The batch was accepted based on acceptable LCS, MS/MSD and RPD results.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

ATTACHMENT B



MWH

QUALITY CONTROL SUMMARY REPORT
FOR THE
SPRING 2015 GROUNDWATER MONITORING EVENT
FORMER MAYTAG LAUNDRY PRODUCTS PLANT #2 FACILITY
NEWTON, IOWA

Prepared for
WHIRLPOOL CORPORATION



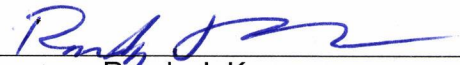
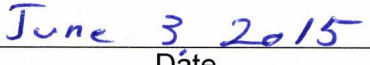


Project No. 10507318.010201

June 2015

Prepared by

MWH
11153 Aurora Avenue
Des Moines, Iowa 50322
515-253-0830

MWH certifies that, to the best of its knowledge and belief, the technical data delivered is complete, accurate, and complies with requirements of the May 2011 Corrective Measures Implementation (CMI) Groundwater Monitoring Work Plan, Sampling and Analysis Plan, and Quality Assurance Project Plan.

Prepared by:	 Karin H. Wilhelm Project Chemist	 Date
Reviewed by:	 Randy J. Kroneman Project Quality Assurance Officer	 Date
Approved by:	 Karin H. Wilhelm Project Manager	 Date

QUALITY CONTROL SUMMARY REPORT

This Quality Control Summary Report summarizes the quality assurance and quality control (QA/QC) results for the samples collected and data generated during the spring 2015 groundwater monitoring event conducted May 4, 5, and 6, 2015, at the former Maytag Laundry Products Plant #2 Facility in Newton, Iowa (site) on behalf of Whirlpool Corporation (Whirlpool). Sample collection and analyses were performed in accordance with the March 18, 2015 letter from the United States Environmental Protection Agency (USEPA) to Whirlpool and the May 2011 Corrective Measures Implementation (CMI) Quality Assurance Project Plan (QAPP).

Groundwater samples from six monitoring wells and associated field QA/QC samples were collected by MWH and analyzed by Keystone Laboratories, Inc. of Newton, Iowa (Keystone). The samples were analyzed for the following site groundwater constituents of concern (COCs), where applicable:

- Tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and 1,1-dichloroethene (1,1-DCE) by SW-846 8260B.
- 1,4-Dioxane by SW-846 8270C.

The following field QA/QC samples were collected by MWH and analyzed by Keystone, as specified in Section 4.6 and Table 3-4 of the QAPP:

- One equipment blank per 20 field samples collected with nondedicated sampling equipment. Nondedicated portable bladder pumps were used for collection of groundwater samples from each of the six monitoring wells.
 - EB01-0515 (collected from bladder pump with serial number 11713 after collecting sample MW2NEW-0515 and before collecting sample MW10A-0515).
- One field duplicate per 20 field samples collected. Six primary groundwater samples were collected.
 - DUP01-0515 (field duplicate of MW10A-0515).
- One matrix spike/matrix spike duplicate (MS/MSD) (two extra sample sets per well) per analysis batch comprised of up to 20 field samples. Six primary groundwater samples were collected and analyzed in one analytical batch.
 - MW23-0515 (collected from the upper aquifer).
- One set of two trip blank vials included with each cooler containing volatile organic compound (VOC) samples. Two coolers containing VOC samples were submitted to the laboratory for analysis.
 - TB01-0515 (included in VOC cooler submitted on May 5, 2015).
 - TB02-0515 (included in VOC cooler submitted on May 6, 2015).

Groundwater and associated QA/QC samples were stored on wet ice in coolers and transported to the analytical laboratory under chain-of-custody documentation, as specified in Section 4.3 of the QAPP.

Data quality was evaluated relative to the CMI data quality objectives (DQOs), data quality indicators (DQIs), and measurement quality objectives (MQOs). The DQOs are the qualitative and quantitative statements developed in Section 3.1 of the QAPP that specify the quality of data required to meet the CMI groundwater monitoring objectives. The DQIs assess data quality in quantitative and qualitative terms; include precision, accuracy, representativeness, comparability, completeness, sensitivity, and traceability; and are described in Section 3.2 of the QAPP. The MQOs are the control limits established for each DQI and are listed in Tables 3-4 and 4-1 of the QAPP and in the laboratory analytical reports.

This data evaluation is presented in terms of these DQIs and is generally based on applicable portions of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008) and the QC limits presented in the laboratory method-specific standard operating procedures (SOPs), analytical reports, and QAPP. The analytical data were reviewed, verified, and qualified based on results of the following QC parameters and samples, where applicable:

- Analytical methods.
- Analyte lists.
- Sample preservation.
- Analytical holding times.
- Reporting limits.
- Initial calibration.
- Initial calibration verification (ICV) standards.
- Mass tune standards.
- Surrogate spikes.
- Internal standards.
- Method blank samples.
- Continuing calibration verification (CCV) standards.
- MS/MSD samples.
- Laboratory control standards/laboratory control standard duplicates (LCS/LCSDs).
- Trip blank samples.
- Equipment blank samples.
- Field duplicate samples.

The following discussions describe how the data were verified for this project and identify data that have associated QC results outside of acceptance criteria. Data qualified based on results of the data validation are presented in Table 1. Data verification forms are included in Attachment A.

1.0 COMPLETENESS EVALUATION

Completeness is a measure of the amount of valid data obtained from a measurement system relative to the amount of data scheduled for collection under correct, normal conditions. Completeness measures the effectiveness of the overall investigation in collecting the required samples, completing the required analyses, and producing valid results. Completeness was calculated by dividing the number of acceptable sample results by the total number of scheduled sample results.

1.1 Sampling Completeness

The field completeness goal for the number of samples collected compared to the number of samples scheduled for collection is 90 percent (%). Each sample was collected and analyzed as scheduled in the March 18, 2015 USEPA letter resulting in 100% field completeness. The sampling completeness goal was met.

1.2 Analytical Completeness

The laboratory completeness goal for the number of acceptable sample results compared to the total sample results is 90%. Only results qualified "R" (unusable) are not considered acceptable sample results for calculating laboratory completeness. Sample results with other qualifiers are considered quantitative and acceptable. No analytes were qualified "R" as unusable. Laboratory completeness was 100% for each analyte. The laboratory completeness goal was met.

2.0 REPRESENTATIVENESS EVALUATION

Representativeness is a qualitative expression of the degree to which sample data accurately and precisely represent a characteristic of a population, a sampling point, or an environmental condition. Representativeness is maximized by ensuring, for a given task, the number and location of sampling points, and the sample collection and analysis techniques are appropriate for the specific investigation; and the sampling and analysis program provides information reflecting "true" site conditions.

Laboratory data were evaluated for representativeness by assessing compliance with specified analytical criteria in the QAPP and laboratory SOPs, sample preservation and holding time criteria, and field duplicate sample results.

2.1 Sampling and Analysis Plan (SAP) and QAPP Compliance

Groundwater samples were collected from the locations specified in the March 18, 2015 USEPA letter and analyzed in accordance with the QAPP.

2.2 Sample Preservation

Sample preservation is achieved by method-specific addition of chemical preservatives to sample containers and/or maintaining method-specific sample temperatures. Sample preservation is generally intended to retard biological action, retard hydrolysis, and reduce sorption effects. Representativeness was evaluated in terms of the method-established sample preservation acceptance criteria presented in the laboratory SOP.

The laboratory analytical reports list any sample pH found to be outside of acceptance criteria. Sample receipt information including sample integrity and temperature is included in the laboratory analytical report. Each sample met the established sample preservation criteria.

2.3 Holding Time

Holding time reflects the length of time after sample collection that a sample or extract remains representative of environmental conditions. Depending on the analysis, either one or two holding times were evaluated. For analyses that do not require sample extraction, only one holding time was evaluated (the length of time between sample collection and sample analysis). For analyses that require sample extraction prior to analysis, two holding times were evaluated (the length of time from sample collection to sample extraction and the length of time from sample extraction to sample analysis). Data for samples that were extracted and analyzed within holding time criteria are considered representative. Representativeness was evaluated in terms of the method-established holding time acceptance criteria presented in the laboratory SOPs. For samples that were extracted or analyzed outside of holding time criteria, the sample data are qualitatively evaluated to determine the potential effect of the hold time exceedance on sample representativeness. Each sample met the established holding time.

2.4 Field Duplicate Samples

For duplicate measurements, precision is expressed as the relative percent difference (RPD) of the pair and is calculated using the following equation:

$$RPD (\%) = \frac{|D_1 - D_2|}{1/2 (D_1 + D_2)} \times 100$$

Where: D_1 = concentration of analyte in the primary sample.
 D_2 = concentration of analyte in the duplicate sample.

The RPD was calculated only for analytes that were detected above the method reporting limit (MRL) in both the primary and duplicate samples. Groundwater field duplicate results should have an RPD less than or equal to 25% when both the primary and duplicate sample results are greater than or equal to five times the MRL; or less than or equal to 50% when the primary and/or duplicate sample result is less than five times the MRL, but greater than the detection limit. The duplicate sample results are presented in Table 2. The field duplicate sample results met the established precision criteria.

3.0 ACCURACY EVALUATION

Accuracy is a measure of the bias of a method or the level of agreement between a measurement and a known true value. Laboratory accuracy was evaluated using the initial calibration, ICV, CCV, method blank, trip blank, equipment blank, mass tune standard, surrogate spike, internal standard, MS/MSD, and LCS results.

3.1 Initial Calibration

Initial calibration demonstrates analytical instrumentation is capable of acceptable performance at the beginning of an analytical run and of producing a linear calibration curve. Accuracy was evaluated in terms of the method-established initial calibration relative standard deviation and correlation coefficient acceptance criteria presented in the laboratory SOP. Initial calibration results are presented in the laboratory analytical reports. The initial calibration results met the established criteria.

3.2 Calibration Verification

ICV samples were analyzed immediately following calibration and CCV samples were analyzed during each analytical batch before batch samples and after a specific number of samples to evaluate calibration accuracy for each analyte. The percent difference (%D) for each ICV and CCV was compared to the method established control limits presented in the laboratory SOPs and analytical reports to assess analytical accuracy.

%D is calculated using the following equation:

$$\%D = \frac{|RF_i - RF_c|}{RF_i} \times 100\%$$

Where: RF_i is the average response factor from the initial calibration.

RF_c is the average response factor from the calibration verification standard.

Calibration verification results are presented in the laboratory analytical reports. The ICV and CCV sample results met the established criteria.

3.3 Mass Tune Standards

For gas chromatography/mass spectrometry (GC/MS) methods, the analytical instruments are tuned to demonstrate the instrument is able to detect the compounds of interest during analysis. Mass tune standard data were compared to the method-established criteria presented in the laboratory SOPs and analytical reports to evaluate analytical accuracy. Mass tune standard results are presented in the laboratory analytical reports. The mass tune standard results met the established criteria.

3.4 Blanks

Target analytes should not be detected in method blanks at concentrations above the laboratory-established MRL presented in the laboratory analytical report. If a target analyte was detected in a blank and in an associated sample, and the concentration of the analyte in the sample was less than five times (ten times for a common volatile laboratory contaminant) the concentration detected in the blank, the analyte concentration detected in the sample was qualified with a "UB" flag to indicate a nondetect. If the concentration of a target analyte in a sample was greater than five times (ten times for a common volatile laboratory contaminant) the concentration detected in an associated blank, the sample concentration was not qualified.

3.4.1 Trip Blanks. A trip blank accompanied each cooler containing samples for VOC analysis and was analyzed to assess whether cross contamination of samples occurred from sample containers or other samples during transport to and at the laboratory. Each trip blank consisted of a set of two VOC sample vials that had been filled by the laboratory with organic-free water and accompanied the empty sample containers to the site. The trip blanks remained unopened during the sampling activities. Results of the trip blank analyses are presented in the laboratory analytical reports. Each trip blank met the established criteria.

3.4.2 Method Blanks. The method blank contains each of the reagents used in the processing of samples and is carried through the complete analytical procedure used for the samples. Results of the method blank analyses are presented in the laboratory analytical report. The method blank results met the established criteria.

3.4.3 Equipment Blanks. Equipment blanks are scheduled to be collected at a frequency of 1 equipment blank per 20 samples collected with nondedicated equipment. Equipment blank samples were collected by rinsing the decontaminated bladder pumps with deionized water to assess the presence of possible target analyte carry-over between monitoring wells. The equipment blank frequency and results met the criteria established for equipment blanks in the QAPP.

3.5 Surrogate Spikes

Surrogate spike recoveries were used to evaluate the accuracy of the analytical data and to monitor laboratory control procedures for organic analyses. Samples were spiked with surrogates according to the laboratory SOP. The surrogate spike percent recovery (%R) data were evaluated using the laboratory-established acceptance criteria presented in the laboratory analytical report. %R is calculated using the following equation:

$$\%R = \frac{|A - B|}{C} \times 100\%$$

Where: A = The measured concentration of the spiked analyte in a spiked sample.
B = The measured concentration of the spiked analyte in an unspiked sample.
C = The concentration of the analyte used for spiking.

The surrogate spike results are presented in the laboratory analytical reports with the sample data. The surrogate spike results met the established criteria.

3.6 Internal Standards

Internal standards are used to assess accuracy and to determine the concentration of target analytes in samples for GC/MS analysis. Internal standards are spiked in the sample after sample preparation/extraction, but prior to analysis. Analyte concentration is determined using the following equation:

$$C_S = \frac{A_S \times C_{IS}}{A_{IS} \times RF}$$

Where: C_S = Concentration of the analyte or surrogate.

A_S = Peak area (or height) of the analyte or surrogate.

C_{IS} = Concentration of the internal standard.

A_{IS} = Peak area (or height) of the internal standard.

RF = Average response factor of calibration curve.

Accuracy is assessed by comparing the internal standard extracted ion current profile (EICP) and retention time to the control limits established by the method and presented in the laboratory SOPs and analytical reports. Internal standard results are presented in the laboratory analytical reports. The internal standard results met the established criteria.

3.7 LCS/LCSDs

LCS/LCSDs were analyzed to assess accuracy in the absence of matrix effects. Reagent grade water was spiked with target analytes prior to analysis. The %R data of the spiked compounds were compared to the laboratory established control limits presented in the laboratory analytical report. The LCS/LCSD recoveries met the established criteria.

3.8 MS/MSD Samples

MS/MSD sample pairs were analyzed to assess accuracy and to identify possible adverse matrix effects. These samples were spiked with target analytes prior to extraction or analysis. MS/MSD results are presented in the laboratory analytical reports. The %R data of the spiked compounds were compared to the laboratory established control limits presented in the laboratory analytical report. The MS/MSD recoveries met the established criteria.

4.0 PRECISION EVALUATION

Precision measures the reproducibility of measurements under a given set of conditions, and is expressed as RPD. Laboratory precision was evaluated using the RPDs between the MS/MSD samples, LCS/LCSDs, and field duplicate samples. The following criteria were used to evaluate precision.

4.1 MS/MSDs

MS/MSD sample pairs were analyzed to assess precision. These samples are spiked with target analytes prior to extraction or analysis. MS/MSD results are presented in the laboratory analytical reports. The RPDs of the spiked compounds were compared to the laboratory-established control limits presented in the laboratory analytical report. Only the parent sample results are qualified based on MS/MSD results. Data are not qualified if the parent sample results are greater than four times the spike concentration. The MS/MSD RPDs met the established criteria.

4.2 LCS/LCSDs

LCS/LCSD pairs were analyzed to assess precision. Reagent-grade water was spiked with target analytes prior to analysis. The RPDs of the spiked compounds were compared to the laboratory-established control limits presented in the laboratory analytical report. LCS/LCSD results are presented in the laboratory analytical reports. LCS/LCSD RPDs met the established criteria.

4.3 Field Duplicates

The RPD was calculated only for analytes that were detected above the MRL in both the primary and duplicate samples. Groundwater field duplicate results should have an RPD less than or equal to 25 percent when both the primary and duplicate sample results are greater than or equal to five times the MRL; or less than or equal to 50 percent when the primary and/or duplicate sample results are less than five times the MRL but greater than the detection limit. The field duplicate sample results met the established precision criteria.

5.0 COMPARABILITY EVALUATION

Comparability is a qualitative parameter that expresses the confidence that one data set may be compared to another. For this project, sample collection and analysis followed standard methods and the data were reported using standard units of measure. As a result, the data from this project should be comparable to other data collected at this site using similar sample collection and analysis methodology.

6.0 SENSITIVITY EVALUATION

Sensitivity is the capability of a method or instrument to discriminate among measurement responses representing different levels of the variable of interest. Sensitivity was evaluated by comparing analyte MRLs to USEPA Maximum Contaminant Levels (MCLs) for the VOC COCs and Regional Screening Level (RSL) for 1,4-dioxane. Adequate sensitivity was demonstrated by MRLs equal to or less than the corresponding MCL or RSL for each COC in each sample.

7.0 TRACEABILITY EVALUATION

Traceability is the extent to which data can be substantiated through documentation. Traceability was evaluated by reviewing field documentation, chain-of-custody documentation,

and analytical reports. Each sample was found to be traceable from collection through analysis.

8.0 DATA VERIFICATION SUMMARY

Based on the evaluated data completeness, representativeness, accuracy, precision, comparability, sensitivity, and traceability, the spring 2015 groundwater sample data are considered usable as qualified to verify current COC concentrations in the selected groundwater monitoring wells.

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TABLES

TABLE 1

QUALITY CONTROL PARAMETERS OUTSIDE OF CONTROL LIMITS RESULTING IN QUALIFIED DATA

Laboratory Work Order	Preparation Batch	Analytical Sequence	QC Sample /Parameter	Control Limits	Result	Analyte(s)	Sample(s) Affected	Qualifier	Qualifier Applied To	Qualified Sample Result
No Spring 2015 groundwater data was qualified due to QC parameters outside of control limits.										

Notes:

QC = Quality control.

TABLE 2
FIELD DUPLICATE SAMPLE RESULTS

Sample Identification:		MW10A-0515	DUP01-0515
Sample Date:		5/6/2015	5/6/2015
Sample Type:		Primary	Duplicate

<u>Analytical Parameters</u>	<u>Units</u>			<u>RPD</u>
Tetrachloroethene	µg/L	<1.0	<1.0	NA
Trichloroethene	µg/L	<2.0	<2.0	NA
cis-1,2-Dichloroethene	µg/L	<1.0	<1.0	NA
1,1-Dichloroethene	µg/L	3.5	3.3	6%
1,4-Dioxane	µg/L	10	9	11%

Notes:

< = Less than.

µg/L = Microgram(s) per liter.

NA = Not applicable.

RPD = Relative percent difference.